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#### **REFERENCES AND NOTES**

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(54) Solids dispenser, e.g. for ice cubes

(57) A dispenser for solid bodies, especially ice cubes, has an optionally insulated casing (11) with a loading cartridge (13) serving as a lid. In the dispenser is a hopper (21) above a perforated chute (24) leading to an outlet gate (36) and an auxiliary chute gate (31) before it, with space for one ice cube between the gates. Raising a receptacle (40) under an actuating ring (17) lifts the ring to open the outlet gate and close the auxiliary gate, whereupon an ice cube is dispensed into the receptacle. On removing the receptacle, the outlet gate is closed, and the auxiliary gate is opened, by a spring (39), to allow another ice cube to slide down the chute to the outlet gate. A slide (42) in the chute agitates the ice cubes during this operation to ensure delivery of the next ice cube. A sump (26) collects melt water. The device is used for hygienically storing and dispensing ice in commercial or domestic premises.

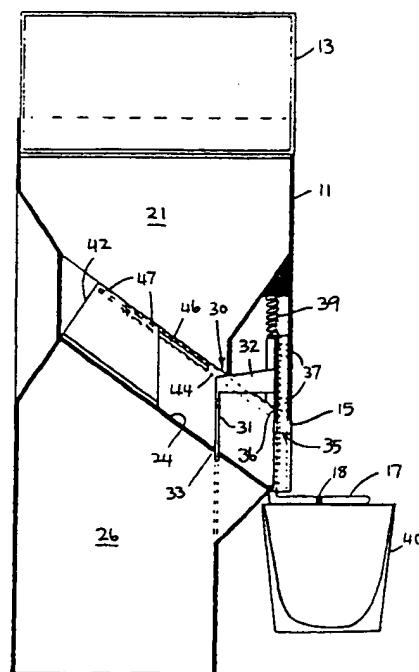


Figure 4

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1/6

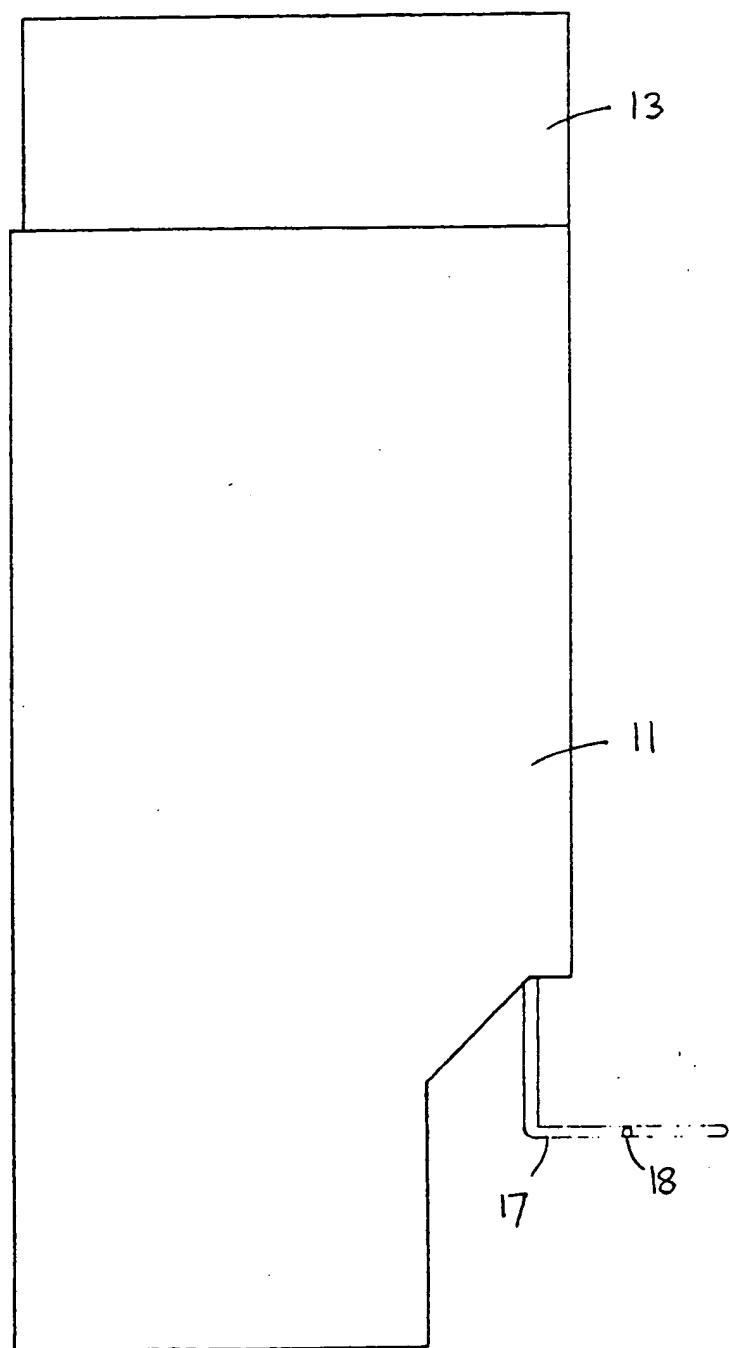


Figure 1

2/6

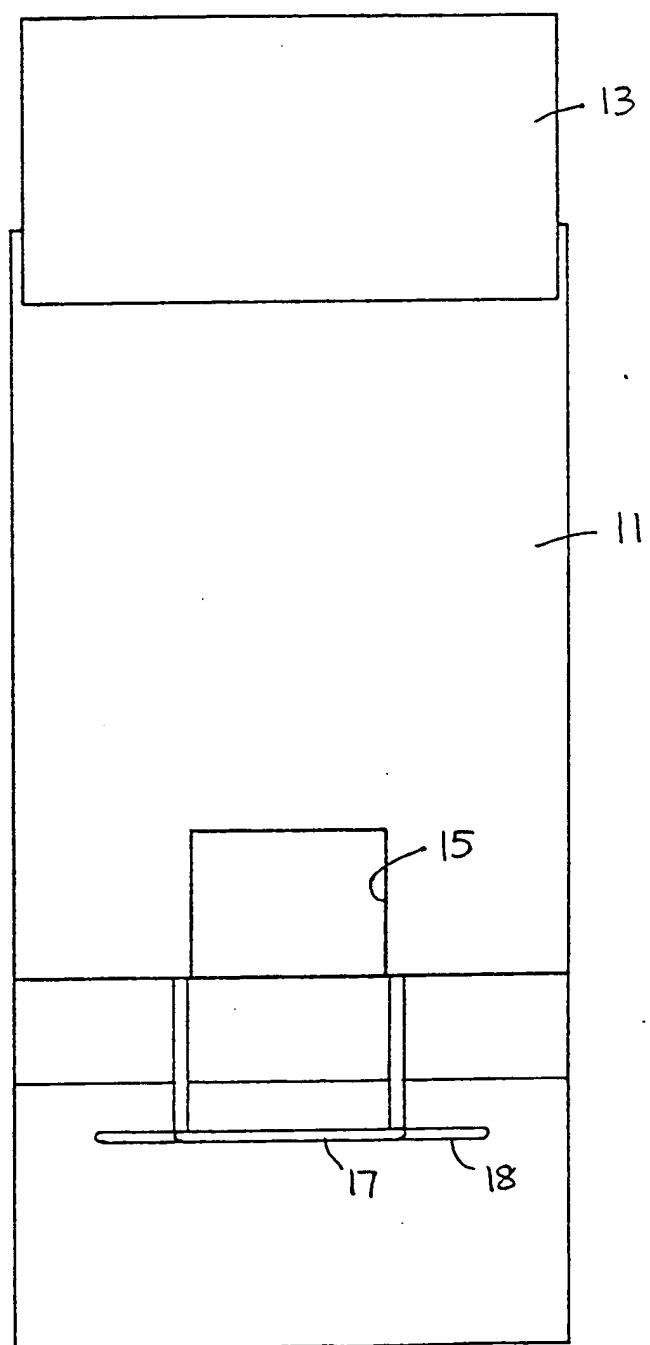


Figure 2

3/6

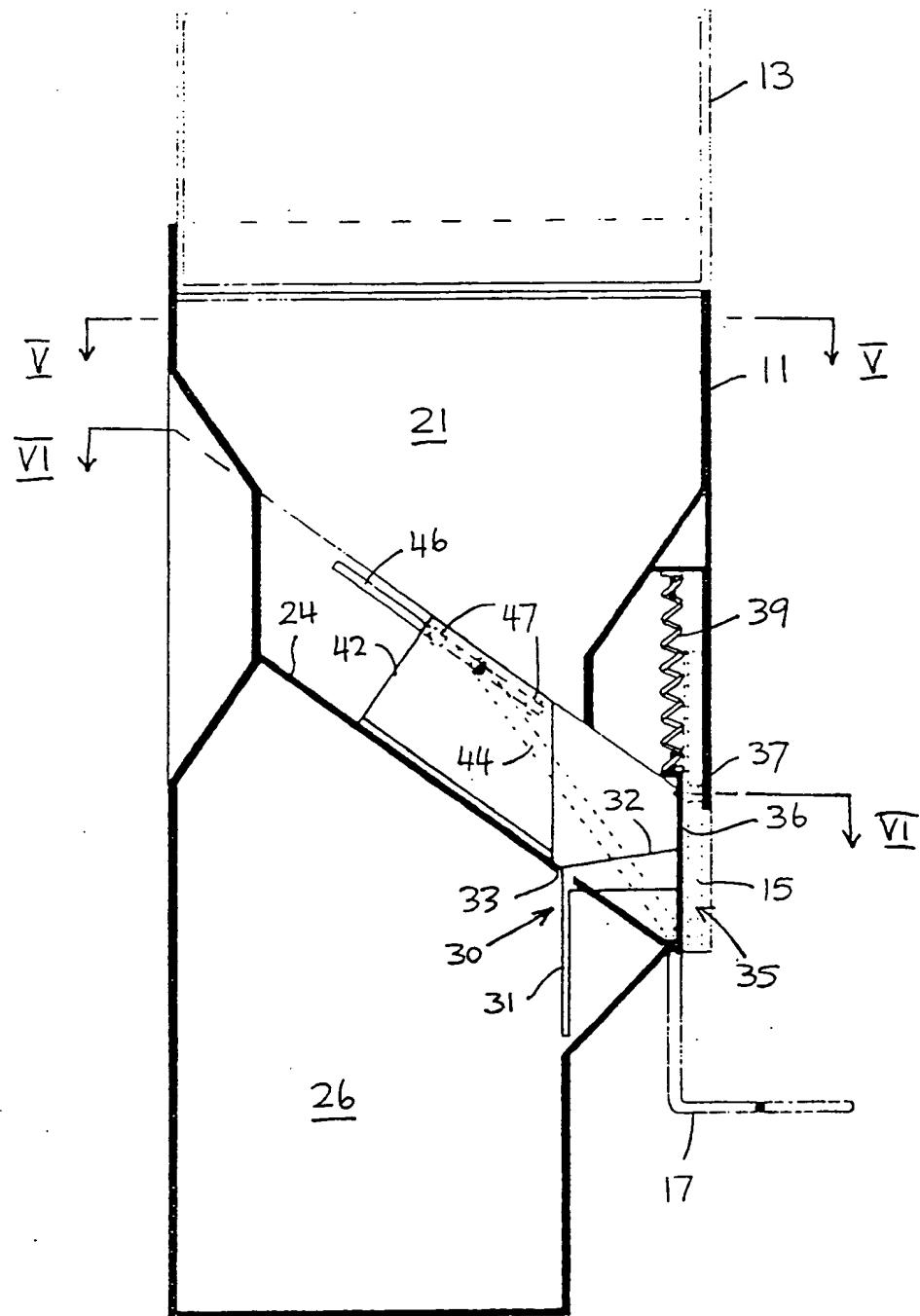


Figure 3

4/6

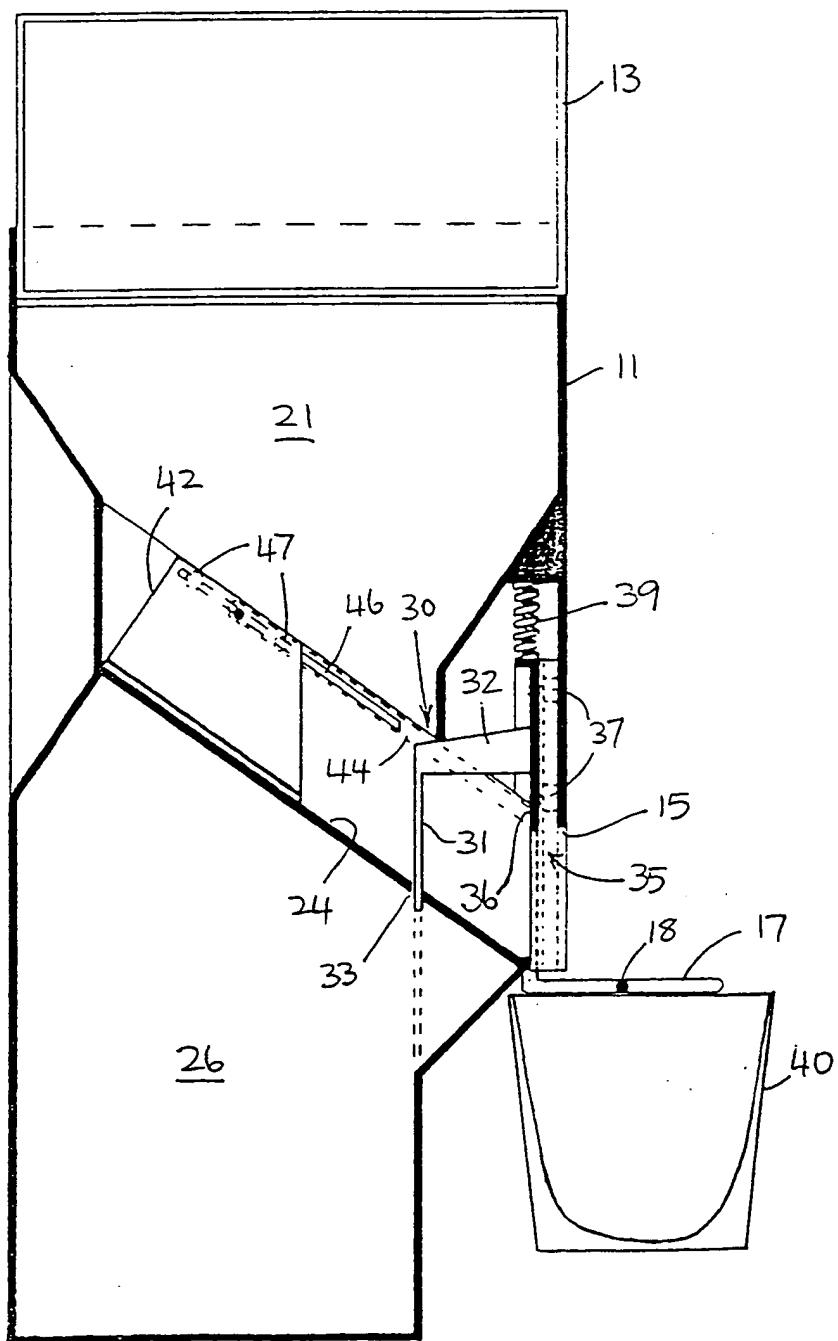
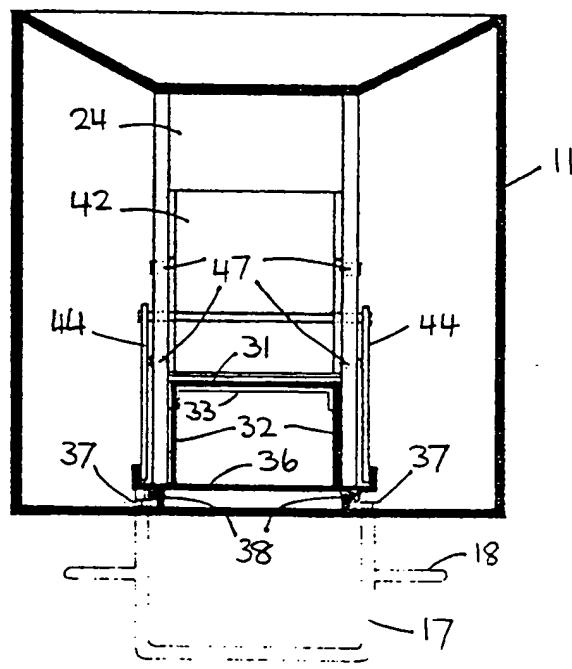
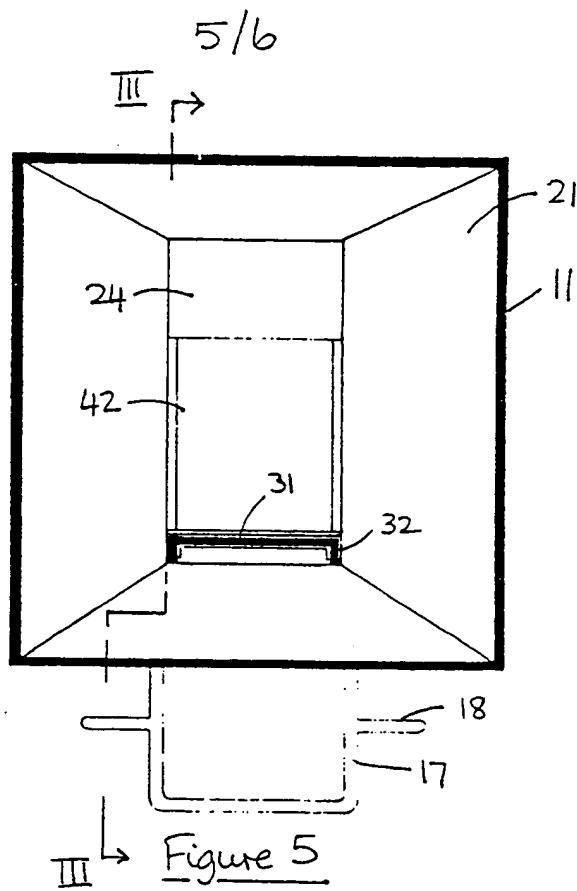


Figure 4



6/6

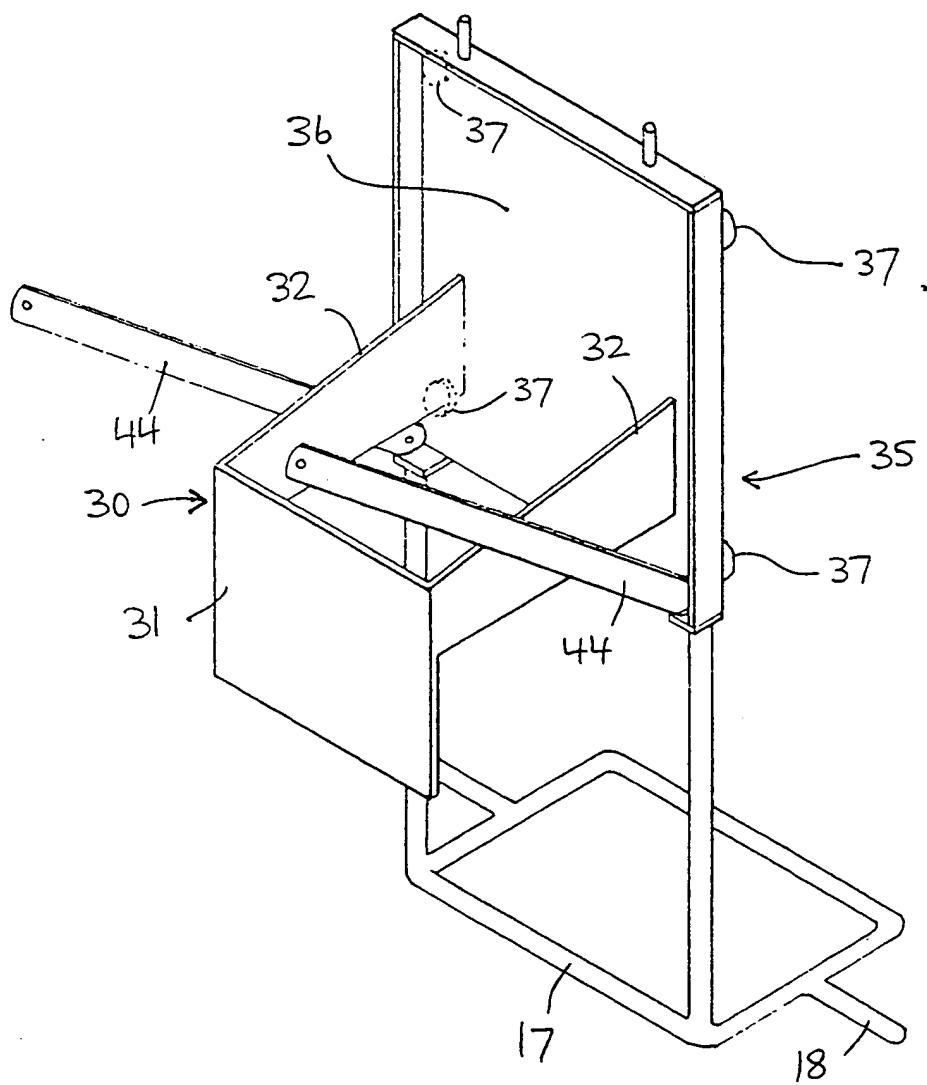


Figure 7

SOLIDS DISPENSER

This invention relates to a solids dispenser, that is to say a dispenser for solid bodies or blocks. In a preferred embodiment the invention

5 provides an ice cube dispenser, and in this connection it must be understood that the word 'cube' is not intended to be limited to a geometrically cubic body, but on the contrary is used in the loose domestic sense to refer to any shape into which a piece of ice may be frozen; and also the shapes when partially melted therefrom.

10

It is envisaged that the invention will find particular use in connection with commercial sales of food and drink, where clean and hygienic storage and handling are of paramount importance. Many small solid bodies are sold wrapped for this reason - for example, sugar cubes - but ice is obviously unsuited to this approach. In bars, for example, ice cubes are generally dispensed from bowls by tongs or spoons, a process which does not guarantee hygiene.

20 According to the invention there is provided a dispenser for solid bodies, comprising a hopper, a chute connecting the hopper to an outlet for dispensing solid bodies from the hopper, outlet closure means, auxiliary closure means for the chute before the outlet and spaced therefrom, means for opening the outlet closure means and closing the auxiliary closure means in response to the presentation of

25 a receiving vessel to the outlet, and means for closing the outlet closure means and opening the auxiliary closure means in response to the removal of the receiving vessel from the outlet.

30 This dispenser is suitable for dispensing solid bodies or blocks of all kinds, according to its dimensions, especially the dimensions of the chute. The outlet closure means and the auxiliary closure means in the chute are spaced apart by sufficient distance to accommodate at least one of the bodies in the chute between them. The auxiliary closure serves to hold back other bodies while the body or bodies

35 between the auxiliary closure and the outlet is or are dispensed.

Preferably, the outlet closure means and the auxiliary closure means are operatively connected whereby simultaneously to open and close, or close and open, respectively. In a convenient arrangement, the respective closure means are sliding gates, and it is often convenient  
5 that these be connected rigidly together.

It is possible for the solid bodies to jam in the chute, or less likely in the hopper; and to avoid or mitigate this problem, the dispenser may comprise means for agitating solid bodies contained therein upon  
10 actuation of the closure means. A preferred embodiment of the invention uses a slide for this purpose in the chute.

A suitable slide may be mechanically linked to the closure means and adapted to slide along the chute as the closure means move. The  
15 slide may comprise a base and sides conforming to the inner dimensions of the chute, and may be open ended.

In order to transfer solids hygienically to the dispenser, it may include a loading cartridge located above the hopper, comprising a  
20 removable and replaceable container for solid bodies to be dispensed and a door in the base thereof adapted to be opened by remote means when the cartridge containing the solid bodies is located above the hopper, to discharge the bodies into the hopper.

25 For dispensing ice cubes, the dispenser may be thermally insulated, although by ensuring a certain melt rate, ice can be relied on not to remain stored longer than is acceptable on hygiene grounds. Melt water drain holes may be provided in the chute, and a sump below the chute, with a drain cock or permanently connected outlet pipe to  
30 waste.

The dispenser is actuated in response to positioning a receiver for the solid body or bodies at the outlet, permitting one handed operation. Suitably, the means for opening the outlet closure means comprises an  
35 actuating member at the outlet that is displaceable by the presentation of a receiving vessel thereto. In a preferred embodiment

the actuating member comprises a ring adapted to open the outlet closure means upon being raised by the presentation of a receiving vessel to the ring from below, the ring being so positioned and dimensioned that a body dispensed from the opening may fall through  
5 the ring into the vessel.

One embodiment of the invention is illustrated in the accompanying drawings by way of example only. In the drawings:-

10 Figure 1 is side elevation of an ice cube dispenser in accordance with the invention;

Figure 2 is a front elevation;

15 Figure 3 is a sectional view corresponding to Figure 1, taken on the line III-III in Figure 5;

Figure 4 is a similar view to Figure 3 but with the dispenser open, as when dispensing an ice cube;

20 Figure 5 is a sectional plan view taken on the line V-V in Figure 3;

25 Figure 6 is a sectional plan view taken on the line VI-VI in Figure 3; and

Figure 7 is an isometric view of the closure assembly of the ice cube dispenser.

30 The ice cube dispenser shown in the drawings is provided with an outer casing 11 and a loading cartridge 13 serving as a lid. Both the casing and the cartridge may be thermally insulated.

Also visible externally are dispenser outlet 15 and actuating member  
35 17, in the form of a ring, below the outlet. The ring has lateral extensions 18 to assure engagement by variously sized receiving

vessels which may be presented to the actuating member from below, as shown in Figure 4.

Referring particularly to Figures 3 to 6, the internal structure of the  
5 dispenser comprises an upper hopper 21 with sides tapering inwardly to a chute 24. Below the chute is a sump 26. The chute slopes downwardly to the outlet 15.

Before the outlet, the chute is provided with auxiliary closure means  
10 30 comprising a gate 31 carried on arms 32 and extending through slot 33 in the floor of the chute. At the outlet are outlet closure means 35, which comprise a gate 36 located by rollers 37 held within flanges 38 on either side of the outlet.

15 The auxiliary closure means 30 are carried on outlet gate 36 by mounting the arms 32 rigidly thereon. The outlet gate 36 also carries actuating member 17 extending downwardly therefrom (Figure 7). This whole closure assembly is slideable up and down in the dispenser, riding on rollers 37 in flanges 38.

20 Figures 3 and 4 show the two extreme positions of the closure assembly. In Figure 3 the outlet gate 36 is at its lowest position, closing dispenser outlet 15. In this position of the closure assembly, auxiliary gate lies wholly below the chute 24. In Figure 4 the outlet gate has been lifted to its highest position, by presentation of an ice cube receiving vessel, namely a tumbler 40, to the actuating member 17 from below, and raising the ring on the tumbler brim. In this position of the closure assembly, dispenser outlet 15 is open, but auxiliary gate 31 has been lifted to block the chute 24:

30 The spacing between auxiliary gate 31 and outlet gate 36 is designed to accommodate a single ice cube. The dimensions chosen will depend on the size of the ice cube intended for use with the dispenser. As the outlet gate is opened to allow the lowermost cube in the chute 35 to fall through the outlet and through the ring into the tumbler, the auxiliary gate holds back the other cubes in the chute. As the outlet

gate is closed, the auxiliary gate opens and allows the cubes to slide down the chute towards the outlet, and another cube to drop into the chute from those contained in the hopper.

5 If the ice has melted substantially, or if smaller cubes are used, two or even more cubes may be dispensed at a time. This is not a problem, and indeed may be an advantage, if the object is to dispense a given amount of ice, rather than to dispense a single block of ice irrespective of size.

10

Lowering of the closure assembly upon removal of the receiving vessel 40 is assisted by spring means 39 acting on the closure assembly.

15

The chute 24 is perforated with melt water drain holes, so that melt water from ice in the hopper and chute can drain to sump 26. The sump can be drained continuously or as required.

20

It is a feature of this embodiment of the invention that a slide 42 is provided in the chute for agitating ice cubes contained in the dispenser, and so to assist the cubes to drop after one has been dispensed. Without means of agitation, the cubes may bridge the chute or jam in some other way.

25

Slide 42 comprises a base and sides conforming to the inner dimensions of the chute, and is open ended. It is mechanically linked to the closure assembly by pivot arms 44 connecting outlet gate 36 (Figure 7) to the slide (Figure 3). Guide slots 46 in each side of the chute are engaged by rollers 47 on the sides of the slide to keep the slide properly positioned in the chute.

30

Loading cartridge 13 is used for recharging the hopper and also serves as a lid. It has a door in its base which can be opened by any convenient remote means, that is to say by means that can be actuated when the cartridge is on the hopper and the door is therefore inside the dispenser. The empty cartridge is refilled with

fresh ice cubes after removing it from the dispenser, inverting it and opening the door. The door is then closed, the cartridge is turned back and repositioned as a lid on the hopper, and the door is opened to discharge the ice cubes into the dispenser.

5

While the invention has been described with reference to specific elements and combinations of elements, it is envisaged that each element may be combined with any other or any combination of other elements. It is not intended to limit the invention to the particular 10 combinations of elements suggested. Furthermore, the foregoing description is not intended to suggest that any element mentioned is indispensable to the invention, or that alternatives may not be employed. What is defined as the invention should not be construed as limiting the extent of the disclosure of this specification.

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CLAIMS

1. A dispenser for solid bodies, comprising a hopper, a chute connecting the hopper to an outlet for dispensing solid bodies from the hopper, outlet closure means, auxiliary closure means for the chute before the outlet and spaced therefrom, means for opening the outlet closure means and closing the auxiliary closure means in response to the presentation of a receiving vessel to the outlet, and means for closing the outlet closure means and opening the auxiliary closure means in response to the removal of the receiving vessel from the outlet.
2. A dispenser according to claim 1, wherein the outlet closure means and the auxiliary closure means are operatively connected whereby simultaneously to open and close, or close and open, respectively.
3. A dispenser according to claim 2 wherein the respective closure means are sliding gates connected rigidly together.
4. A dispenser according to any one of the preceding claims comprising means for agitating solid bodies contained therein upon actuation of the closure means.
5. A dispenser according to claim 4 wherein the means for agitating comprises a slide in the chute.
6. A dispenser according to claim 5 wherein the slide is mechanically linked to the closure means and is adapted to slide along the chute as the closure means move.
7. A dispenser according to claim 5 or claim 6 wherein the slide comprises a base and sides conforming to the inner dimensions of the chute, and is open ended.

8. A dispenser according to any one of the preceding claims including a loading cartridge located above the hopper, comprising a removable and replaceable container for solid bodies to be dispensed and a door in the base thereof adapted to be opened by remote means when the cartridge containing the solid bodies is located above the hopper, to discharge the bodies into the hopper.

9. A thermally insulated ice cube dispenser according to any one of the preceding claims.

10

10. An ice cube dispenser according to claim 9, provided with melt water drain holes in the chute.

15

11. An ice cube dispenser according to claim 10, provided with a sump below the chute.

20

12. An ice cube dispenser according to any one of claims 9 to 11, wherein the auxiliary closure means is sufficiently spaced from the outlet closure means to permit at least one unmelted ice cube to occupy the chute therebetween.

25

13. A dispenser according to any one of the preceding claims wherein the means for opening the outlet closure means comprises an actuating member at the outlet that is displaceable by the presentation of a receiving vessel thereto.

30

14. A dispenser according to claim 13 wherein the actuating member comprises a ring adapted to open the outlet closure means upon being raised by the presentation of a receiving vessel to the ring from below, the ring being so positioned and dimensioned that a body dispensed from the opening may fall through the ring into the vessel.

35

15. A dispenser for solid bodies substantially as herein described with reference to and illustrated in the accompanying drawings.

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